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temporally adjusted content contemporaneously with said currently broadcast programs.

REMARKS

The applicants request that the Examiner enter this amendment prior to examining the application. By this amendment, applicants have amended the specification to correct minor typographical errors and have added new claims 2-28 to provide the applicants with the scope of protection to which they believe themselves entitled. The new claims are supported by the specification and drawings of the originally filed application and do not contain new matter.

If the Examiner believes that there are any issues that can be resolved by telephone, it is requested that the Examiner telephone Eamon J. Wall, Esq. at (732) 530-9404 so appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

8/8/02

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APPENDIX I

MARKED-UP VERSION OF THE SPECIFICATION

Paragraph beginning on page 11, line 22 and ending on page 12, line 4:

Time-Shifted Content Introduction and Storage

Generally speaking, time shifted content comprises sufficient information to convey a program to a viewer at time different than its original broadcast time, and with the ability to interactively modify the presentation by, for example, skipping or streaming forward or backward in presentation time. In one embodiment, time-shifted content includes real time encoded play tracks, fast-forward tracks, and rewind tracks, as well as the Entry Point Data (EPD) files associated with each track. In one embodiment, each track is multiplexed at a transport rate of 3.6 Mbs for PAL content or 3.37 Mbs for NTSC. The play tracks include Dolby audio encoded at 192 Kbps. The fast forward and rewind tracks will not contain audio and will have a slightly higher video-encoding rate.

Paragraph beginning on page 13, line 20 and ending on page 13, line 23:

Each Encoder writes the encoded content into buffer memory 174. The Time Shift Post Process (TSPP) function 173 reads the content from the buffer memory 174, generates Entry Point Data (EPD) files for each of the 3 encoded video streams, and writes those files to memory buffers accessible by the Server.

Paragraph beginning on page 13, line 24 and ending on page 14, line 4:

The Encoder Switch 171 is utilized to eliminate the need to dedicate an encoder for each input channel. The Encoder Switch 171 couples any of the, illustratively, N content streams provided by the Decoder 106 to any of the encoders 172. Where only a subset of the available content streams are to be time-shifted, the TSC 175 causes the encoder switch to couple only the appropriate subset of baseband content streams to respective encoders 172. In one embodiment, the encoder switch accepts audio and video streams from multiple broadcast channels

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and allocates the streams to encoders based on encoder availability. In this manner, the need to dedicate an encoder for each channel is eliminated.

Paragraph beginning on page 14, line 5 and ending on page 14, line 11:

The e[E]ncoders 172 selected by the e[E]ncoder s[S]witch 170 receive input from broadcast receivers in, illustratively, a decoded baseband audiovisual format and encode the audio and video information according to the MPEG-2 standard to provide, at respective outputs, MPEG-2 transport streams suitable for use as play, fast forward and rewind streams. The use of such "play," "FF" and "RW" in response to user requests for corresponding "play," "FF" and "RW" functions provides the VCR-like user manipulations.

Paragraph beginning on page 14, line 12 and ending on page 15, line 2:

In an exemplary embodiment of the invention, each of the encoders 172 comprises a so-called "all-in-one" that described in more detail in U.S. Patent [Application Serial No. 09/201,529 (Attorney Docket No. DIVA/167), filed on November 30, 1998] No. 6,389,218, issued May 14, 2002, which is incorporated herein by reference in its entirety. Briefly, the "all-in-one" encoder simultaneously produces MPEG-2 compliant fast forward, fast reverse and normal play bitstreams from a sequence of video frames such as provided by an IEC 601-format digital video baseband stream. The encoder subsamples the video sequence, extracting a plurality of frames from the video sequence and buffering the subsampled frames. Simultaneous with the subsampling and buffering, the source frames are encoded within a real-time encoder, e.g., an MPEG-2 encoder. The buffered frames are recalled from the buffer and coupled to a second real-time encoder. The second encoder forms both the fast forward and fast reverse bitstreams using a time multiplexing technique wherein a group of pictures (GOP) for the fast forward stream can be formed, followed by the compression of the same GOP having the frames organized in reverse order. As such, the compressed GOPs are represented by the

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fast forward and fast reverse bitstreams. The play, fast forward, and fast reverse bitstreams for each GOP are organized into a file and stored on the mass storage device (e.g., disk drive array) of a file server.

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APPENDIX II
MARKED-UP CLAIMS

2. (newly added) In a system adapted to receive broadcast content from each of a plurality of content sources and forward said received broadcast content to a transport network for distribution to subscribers, a method comprising:

in response to a subscriber request for desired broadcast content, storing said desired broadcast content in a server;

forwarding said desired broadcast content to said transport network for distribution to said requesting subscriber; and

in response to a subscriber request for temporally shifted content associated with said desired broadcast content, forwarding said stored broadcast content to said transport network for distribution to said requesting subscriber.

3. (newly added) The method of claim 2, further comprising:

forwarding to said transport network only the received broadcast content presently requested by any subscriber.

4. (newly added) The method of claim 2, further comprising:

storing, in said server, broadcast content presently requested by a threshold number of subscribers.

5. (newly added) The method of claim 2, wherein said storing of said desired broadcast content comprises storing a temporally sub-sampled version of the desired broadcast content to generate a fast-forward track.

6. (newly added) The method of claim 2, wherein said storing of said desired broadcast content comprises storing a temporally sub-sampled version of the desired broadcast content in reverse order to generate a reverse track.

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7. (newly added) The method of claim 2, wherein said storing of said desired broadcast content comprises storing a version of the desired broadcast content to generate a play track.
8. (newly added) The method of claim 2, further comprising, storing selected broadcast content during a predetermined time interval of a broadcast schedule.
9. (newly added) The method of claim 2, wherein said subscriber request for temporally shifted content is initiated by receiving a subscriber title selection from a time shift interactive programming guide screen.
10. (newly added) The method of claim 2, wherein said subscriber request for temporally shifted content is initiated by receiving a subscriber title selection from a time shift navigation screen.
11. (newly added) The method of claim 2, wherein said subscriber request for temporally shifted content is initiated by receiving a pause or rewind subscriber selection while broadcasting of said desired content.
12. (newly added) A method for providing video information in an interactive information distribution system to a plurality of subscribers, comprising:
 - receiving a plurality of scheduled broadcast programs in real-time;
 - selecting a portion of said broadcast programs;
 - processing said selected broadcast programs into temporally adjusted content, such that the temporally adjusted content is associated with said selected broadcast programs;
 - storing said temporally adjusted content;
 - broadcasting said plurality of scheduled broadcast programs to said plurality of subscribers; and

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in a first mode of operation, streaming, on-demand, said temporally adjusted content to those subscribers viewing said selected broadcast programs currently being broadcast, such that said subscribers may interactively activate such temporally adjusted content contemporaneously with said currently broadcast programs.

13. (newly added) The method of claim 12, wherein in an alternate mode of operation, streaming, on-demand, said temporally adjusted content to those subscribers viewing said selected broadcast programs previously broadcast, such that said subscribers may interactively activate such temporally adjusted content during viewership of said previously broadcast programs.

14. (newly added) The method of claim 13, wherein said requesting subscribers may interactively switch between said first and second modes of operation.

15. (newly added) The method of claim 12, wherein said selecting step comprises:
monitoring subscriber viewership; and
selecting those broadcast programs having a viewership exceeding a predetermined metric.

16. (newly added) The method of claim 12, wherein said selecting step further comprises:
generating title plans for identifying said broadcast programs to be temporally adjusted; and
defining a temporal availability window for each program.

17. (newly added) The method of claim 16, wherein said processing step comprises:

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generating real-time encoded play tracks, fast-forward tracks, rewind tracks, and entry point data (EPD) files associated with each track., said fast-forward tracks and rewind tracks forming said temporally adjusted content.

18. (newly added) The method of claim 17, wherein said processing step further comprises:

encoding said broadcast programs identified in said title plan to form said temporally adjusted programs; and

buffering said encoded broadcast programs.

19. (newly added) The method of claim 18, wherein said processing step further comprises:

receiving packetized transport streams from at least one encoder; and

inserting title identification codes (TICs) to each packet to enable said transport streams to be identified as said real-time encoded play tracks, fast-forward tracks, and rewind tracks.

20. (newly added) The method of claim 19, further comprising:

generating said EPD files as said fast-forward and rewind tracks are being created.

21. (newly added) The method of claim 20, wherein said EDP files provide transition between streaming of the Play, FF and RW tracks at appropriate points in response to user commands.

22. (newly added) The method of claim 19, wherein said storing step comprises:

receiving said buffered encoded broadcast programs;

storing said real-time play tracks in a plurality of extents;

storing said fast-forward tracks in extents in a front to back order; and

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storing said rewind tracks in extents in a back to front order.

23. (newly added) The method of claim 22, where said storing step further comprises storing selected broadcast programs from a particular channel for a fixed window of time.
24. (newly added) The method of claim 22, where said storing step further comprises storing selected broadcast programs from a plurality of channels.
25. (newly added) The method of claim 12, wherein said first mode of operation further comprises
providing an interactive program guide (IPG) to said subscribers having screens presenting said selected broadcast programs having temporally adjusted content for viewing and selection.
26. (newly added) The method of claim 12, wherein said second mode of operation further comprises
providing a navigator list to said subscribers having screens presenting said selected broadcast programs having temporally adjusted content for viewing and selection.
27. (newly added) The method of claim 12, wherein said first mode of operation further comprises receiving a temporal control message from a subscriber selected from the group of temporal control messages consisting of pause, rewind, and fast-forward.
28. (newly added) An apparatus for providing video information in an interactive information distribution system to a plurality of subscribers, comprising:
means for receiving a plurality of scheduled broadcast programs in real-time;

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means for selecting a portion of said broadcast programs;

means for processing said selected broadcast programs into temporally adjusted content, such that the temporally adjusted content is associated with said selected broadcast programs;

means for storing said temporally adjusted content;

means for broadcasting said plurality of scheduled broadcast programs to said plurality of subscribers; and

in a first mode of operation, means for streaming, on-demand, said temporally adjusted content to those subscribers viewing said selected broadcast programs currently being broadcast, such that said subscribers may interactively activate such temporally adjusted content contemporaneously with said currently broadcast programs.